

# PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference <b>02FEKM001</b>	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/KR2002/001430</b>	International filing date (day/month/year) 27 JULY 2002 (27.07.2002)	Priority date (day/month/year) 27 DECEMBER 2001 (27.12.2001)
International Patent Classification (IPC) or national classification and IPC  <b>IPC7 G06F 1/16</b>		
Applicant  LG ELECTRONICS, INC. et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 3 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

- I. ☒ Basis of the report
- II. ☐ Priority
- III. ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV. ☐ Lack of unity of invention
- V. ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI. ☐ Certain documents cited
- VII. ☐ Certain defects in the international application
- VIII. ☐ Certain observations on the international application

Date of submission of the demand  22 JANUARY 2003 (22.01.2003)	Date of completion of this report  13 APRIL 2004 (13.04.2004)
Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer  UHM, In Kwon  Telephone No. 82-42-481-5712 

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR2002/001430

## I. Basis of the report

## 1. With regard to the elements of the international application:\*

- ☐ the international application as originally filed
- ☒ the description:  
pages 1 - 11, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the claims:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, as amended (together with any statement) under Article 19  
pages \_\_\_\_\_, filed with the demand  
pages 12.13.14.15, filed with the letter of 15.03.2004
- ☒ the drawings:  
pages 1/4 - 4/4, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

## 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

## 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☒ the claims, Nos. 3
- ☐ the drawings, sheet \_\_\_\_\_

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed," and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

# INTERNATIONAL PRELIMINARY EXAMINATION

International application No.

PCT/KR2002/001430

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Claims	1 - 2, 4 - 20	YES
	Claims		NO
Inventive step (IS)	Claims	1 - 2, 4 - 20	YES
	Claims		NO
Industrial applicability (IA)	Claims	1 - 2, 4 - 20	YES
	Claims		NO

### 2. Citations and explanations (Rule 70.7)

The following documents are referred to :

D1 = closing control and opening free assembly for a hinge connection

US 5598607 A(1997.02.04).

D2 = control assembly for a hinge connection US 5682645 A(1997.11.04).

#### Novelty

None of the above documents reveals the configuration of the plane shaped spacer and the elastic members, described in the claims. Therefore, the invention according to claims 1 - 2, 4 - 20 is considered to be novel.

#### Inventive step

This claimed invention relates to a hinge structure for a flat visual display device, wherein the hinge is used as a fabrication between two members on which the hinge is applied, whereby the two members operate smoothly and braking force due to proper frictional force is provided.

D1 teaches a closing control and opening free assembly for a hinge connection between a first segment and a second segment.

D2 reveals a control assembly for a hinge connection between a first segment and a second segment.

Neither D1 or D2 teaches the characteristics of this invention, a plate shaped spacer inserted between the frictional member tightening planes. And they don't have an elastic member whose both ends are hooked at the fixing plate and the pivoting plate respectively, and mounted around the rational shaft, in the added claims 15-20

Therefore, this invention is considered to involve an inventive step.

#### Industrial Applicability

The subject matter of claims 1 - 2, 4 - 20 fulfills the requirements of Article 33(4) PCT because it is useful.

Claims

1. A hinge structure for a flat visual display device comprising:  
a pivotal plate connected to the flat visual display device, for rotation of the  
5 flat visual display device;  
a fixing plate connected to a supporting portion for supporting the flat visual  
display device;  
a rotational shaft inserted to vertical planes of the pivotal plate and the fixing  
plate, for rotation of the pivotal plate in one degree of freedom;  
10 a frictional member mounted around an outer periphery of the rotational shaft,  
for enclosing the rotational shaft, and whose both ends have a frictional member  
tightening plane of a planar shape on which an inserting hole is formed; and  
a tightening member inserted to the inserting hole, for tightening the  
frictional member tightening plane, thereby tightening the rotational shaft by means  
15 of the frictional member, and generating strong breaking force accordingly.
2. The hinge structure for a flat visual display device as set forth in claim 1,  
wherein at least one frictional member is formed on a center of the rotational shaft.
- 20 3. The hinge structure for a flat visual display device as set forth in claim 1,  
wherein a plate shaped spacer is inserted between the tightening planes, for  
supporting force exerted on the frictional member.
4. The hinge structure for a flat visual display device as set forth in claim 1,  
25 wherein a washer is inserted between contact planes of the fixing plate and the pivotal  
plate for swift pivoting operation of the fixing plate and the pivoting plate.
5. The hinge structure for a flat visual display device as set forth in claim 1,  
wherein a frictional housing is formed around an outer periphery of the frictional  
30 member, for preventing destruction of the frictional member in spite of strong force  
exerted by the tightening member.
6. The hinge structure for a flat visual display device as set forth in claim 1,  
wherein a fixing portion of non circular shape is formed on an outer periphery of both

ends of the rotational shaft; and a shaft fixing portion of the pivotal plate is formed in the same shape as the fixing portion, for receiving the fixing portion, whereby the pivotal plate and the rotational shaft are rotated together simultaneously.

5           7. The hinge structure for a flat visual display device as set forth in claim 1, further comprising:

          a guiding protuberance extended to an outside of a vertical plane of the fixing plate;

          a pivotal guiding portion formed on an vertical plane of the pivotal plate in  
10   an arc shape, for receiving the guiding protuberance and restricting a pivoting angle of the pivotal plate accordingly.

          8. The hinge structure for a flat visual display device as set forth in claim 1, wherein a washer of plastic material is inserted on a contact plane between the fixing  
15   plate and the pivotal plate, for abrasion prevention and swift operation.

          9. The hinge structure for a flat visual display device as set forth in claim 1, wherein the frictional member is made of engineering plastic.

20           10. A hinge structure for a flat visual display device comprising:  
          a pivotal plate connected to the flat visual display device, for rotation of the flat visual display device;

          a fixing plate connected to a supporting portion for supporting the flat visual display device;

25           a rotational shaft inserted to vertical planes of the pivotal plate and the fixing plate, for rotation of the pivotal plate in one degree of freedom;

          a frictional member mounted around an outer periphery of the rotational shaft, for enclosing the rotational shaft, and whose both ends have a frictional member tightening plane of a planar shape on which an inserting hole is formed;

30           a tightening member inserted to the inserting hole, for tightening the frictional member tightening plane, thereby tightening the rotational shaft by means of the frictional member, and generating strong breaking force accordingly;

          an elastic member whose both ends are hooked at the fixing plate and the pivoting plate, respectively, and mounted around the rotational shaft, for generating

elastic force in circumferential direction upon rotation of the rotational shaft;

a guiding protuberance extended to an outside of an vertical plane of the fixing plate; and

5 a pivotal guiding portion formed on an vertical plane of the pivotal plate in an arc shape, for receiving the guiding protuberance and restricting a pivoting angle of the pivotal plate accordingly.

11. The hinge structure for a flat visual display device as set forth in claim 10, wherein the elastic member consists of torsion spring in which a predetermined  
10 iron wire is stacked in a coil shape.

12. The hinge structure for a flat visual display device as set forth in claim 10, wherein the one end of the elastic member is hooked on a horizontal plane of the fixing plate and the other end of the elastic member is hooked at a elastic member  
15 hooking protuberance extended to an inside from an horizontal plane of the pivotal plate.

13. The hinge structure for a flat visual display device as set forth in claim 10, further comprising:  
20 a cylindrical spacer mounted around a contact plane between the elastic member and the rotational shaft, for preventing direct contact of the elastic member with the rotational shaft and reducing noise and abrasion accordingly.

14. The hinge structure for a flat visual display device as set forth in claim  
25 10, wherein the frictional member is made of engineering plastic.

Claims

1. A hinge structure for a flat visual display device comprising:
  - a pivotal plate connected to the flat visual display device, for rotation of the
  - 5 flat visual display device;
  - a fixing plate connected to a supporting portion for supporting the flat visual display device;
  - a rotational shaft inserted to vertical planes of the pivotal plate and the fixing plate, for rotation of the pivotal plate in one degree of freedom;
  - 10 a frictional member mounted around an outer periphery of the rotational shaft, for enclosing the rotational shaft, and whose both ends have a frictional member tightening plane of a planar shape on which an inserting hole is formed;
  - a tightening member inserted to the inserting hole, for tightening the frictional member tightening plane, thereby tightening the rotational shaft by means
  - 15 of the frictional member, and generating strong breaking force accordingly; and
  - a plate shaped spacer inserted between the frictional member tightening planes, for supporting force exerted on the frictional member.
2. The hinge structure for a flat visual display device as set forth in claim 1,
- 20 wherein at least one frictional member is formed on a center of the rotational shaft.
3. (canceled)
4. The hinge structure for a flat visual display device as set forth in claim 1,
- 25 wherein a washer is inserted between contact planes of the fixing plate and the pivotal plate for swift pivoting operation of the fixing plate and the pivoting plate.
5. The hinge structure for a flat visual display device as set forth in claim 1,
- wherein a frictional housing is formed around an outer periphery of the frictional
- 30 member, for preventing destruction of the frictional member in spite of strong force exerted by the tightening member.
6. The hinge structure for a flat visual display device as set forth in claim 1,
- wherein a fixing portion of non circular shape is formed on an outer periphery of both

ends of the rotational shaft; and a shaft fixing portion of the pivotal plate is formed in the same shape as the fixing portion, for receiving the fixing portion, whereby the pivotal plate and the rotational shaft are rotated together simultaneously.

5           7. The hinge structure for a flat visual display device as set forth in claim 1, further comprising:

          a guiding protuberance extended to an outside of a vertical plane of the fixing plate;

          a pivotal guiding portion formed on an vertical plane of the pivotal plate in  
10 an arc shape, for receiving the guiding protuberance and restricting a pivoting angle of the pivotal plate accordingly.

          8. The hinge structure for a flat visual display device as set forth in claim 1, wherein a washer of plastic material is inserted on a contact plane between the fixing  
15 plate and the pivotal plate, for abrasion prevention and swift operation.

          9. The hinge structure for a flat visual display device as set forth in claim 1, wherein the frictional member is made of engineering plastic.

20           10. A hinge structure for a flat visual display device comprising:

          a pivotal plate connected to the flat visual display device, for rotation of the flat visual display device;

          a fixing plate connected to a supporting portion for supporting the flat visual display device;

25           a rotational shaft inserted to vertical planes of the pivotal plate and the fixing plate, for rotation of the pivotal plate in one degree of freedom;

          a frictional member mounted around an outer periphery of the rotational shaft, for enclosing the rotational shaft, and whose both ends have a frictional member tightening plane of a planar shape on which an inserting hole is formed;

30           a tightening member inserted to the inserting hole, for tightening the frictional member tightening plane, thereby tightening the rotational shaft by means of the frictional member, and generating strong breaking force accordingly;

          an elastic member whose both ends are hooked at the fixing plate and the pivoting plate, respectively, and mounted around the rotational shaft, for generating



elastic force in circumferential direction upon rotation of the rotational shaft;

a guiding protuberance extended to an outside of an vertical plane of the fixing plate; and

5 a pivotal guiding portion formed on an vertical plane of the pivotal plate in an arc shape, for receiving the guiding protuberance and restricting a pivoting angle of the pivotal plate accordingly.

11. The hinge structure for a flat visual display device as set forth in claim 10, wherein the elastic member consists of torsion spring in which a predetermined  
10 iron wire is stacked in a coil shape.

12. The hinge structure for a flat visual display device as set forth in claim 10, wherein the one end of the elastic member is hooked on a horizontal plane of the fixing plate and the other end of the elastic member is hooked at a elastic member  
15 hooking protuberance extended to an inside from an horizontal plane of the pivotal plate.

13. The hinge structure for a flat visual display device as set forth in claim 10, further comprising:

20 a cylindrical spacer mounted around a contact plane between the elastic member and the rotational shaft, for preventing direct contact of the elastic member with the rotational shaft and reducing noise and abrasion accordingly.

14. The hinge structure for a flat visual display device as set forth in claim  
25 10, wherein the frictional member is made of engineering plastic.

15. A hinge structure for a flat visual display device comprising:

a pivotal plate connected to the flat visual display device, for rotation of the flat visual display device;

30 a fixing plate connected to a supporting portion for supporting the flat visual display device;

a rotational shaft inserted to vertical planes of the pivotal plate and the fixing plate, for rotation of the pivotal plate in one degree of freedom;

a frictional member mounted around an outer periphery of the rotational shaft,

for enclosing the rotational shaft, and whose both ends have a frictional member tightening plane of a planar shape on which an inserting hole is formed;

5 a tightening member inserted to the inserting hole, for tightening the frictional member tightening plane, thereby tightening the rotational shaft by means of the frictional member, and generating strong breaking force accordingly; and

an elastic member whose both ends are hooked at the fixing plate and the pivoting plate, respectively, and mounted around the rotational shaft, for generating elastic force in circumferential direction upon rotation of the rotational shaft.

10 16. The hinge structure for a flat visual display device as set forth in claim 15, wherein the elastic member consists of torsion spring in which a predetermined iron wire is stacked in a coil shape.

15 17. The hinge structure for a flat visual display device as set forth in claim 15, wherein the one end of the elastic member is hooked on a horizontal plane of the fixing plate and the other end of the elastic member is hooked at a elastic member hooking protuberance extended to an inside from an horizontal plane of the pivotal plate.

20 18. The hinge structure for a flat visual display device as set forth in claim 15, further comprising:

a cylindrical spacer mounted around a contact plane between the elastic member and the rotational shaft, for preventing direct contact of the elastic member with the rotational shaft and reducing noise and abrasion accordingly.

25 19. The hinge structure for a flat visual display device as set forth in claim 15, wherein the frictional member is made of engineering plastic.

30 20. The hinge structure for a flat visual display device as set forth in claim 15, a plate shaped spacer is inserted between the frictional member tightening planes, for supporting force exerted on the frictional member.